

AMENDMENT TO THE CLAIMS

1. (canceled)

2. (currently amended) A robotic tube handler system comprising:

 a robotic tube handler having:

 a housing with a perimeter rectangular frame having sides;

 a tube rack bed mounted in the perimeter frame for orthogonal placement of a plurality of tube racks, the bed having a seating structure in which multiple tube racks of identical size seat in a predefined array;

 a support platform mounted in the perimeter frame adjacent the tube rack bed, the support platform having a tube parking holder with a plurality of tube holding locations;

 a tube pick-up mechanism having:

 a crossbar transport unit with tracks located on two opposite sides of the frame;

 a cross beam with two post supports wherein the cross beam is connected to the two post supports and spans the bed and platform and wherein the two post supports engage the tracks and elevate with the cross beam elevated above the bed and platform;

 a transport assembly with a motor and a drive assembly in engagement with each of the post supports with fore and aft transport of the crossbar transport unit on operation of the motor;

 an elevator carriage supported on the cross beam with a transport mechanism having a motor and a drive assembly in engagement with

the cross beam with side to side transport of the elevator carriage on the cross beam on operation of the motor;

an elevator assembly;

a pick head unit wherein the elevator assembly has a transport mechanism with a motor that vertically displaces the pick head unit on operation of the motor, the pick head unit having an actuatable pick head with mechanical pick fingers engageable with a tube; and,

a controller with a control unit having electronics operationally connected to the drive motors for precision control of X, Y, Z motion of the pick head unit and actuation of the pick head for select engagement and precision transport of tubes in tube racks seated in the bed and tubes held in the tube parking holder on the support platform during sorting operations.

3. (canceled)

4. (previously presented) The robotic tube handler system of claim 2 wherein the platform has a shuttle holder with a plurality of tube holding locations for placement of a limited number of tubes, wherein the shuttle holder has a transport mechanism that displaces the shuttle holder when transferring tubes to another adjacent robotic tube handler.

5. (previously presented) The robotic tube handler system of claim 2 in combination with tubes having a bottom with an identification element wherein the platform has an identification station that verifies the identity of a discrete tube, wherein the identification station is located on the platform at a location

accessible by the pick head unit and the identification station has an upwardly directed sensor that senses the identification element of a tube when the pick head positions and holds a tube over the sensor.

6. **(previously presented)** The robotic tube handler system of claim 5 wherein the identification station has a barcode reader.

7. **(previously presented)** The robotic tube handler system of claim 5 wherein the identification station has a RFID reader.

8. **(previously presented)** The robotic tube handler system of claim 2 including a tube fill unit wherein the pick head unit on the transport mechanism of the elevator assembly and the tube fill unit are exchangeable.

9. **(previously presented)** The robotic tube handler system of claim 2 wherein the pick head of the pick head unit has four rigid pick fingers that spread when actuated, the pick fingers being configured to selectively and releasably engage a single tube in a rack.

10. **(previously presented)** The robotic tube handler system of claim 2 wherein the system includes racks that have a marking on the rack and the tube handler has a marking reader that reads the marking on the rack and identifies the rack.

11. **(canceled)**

12. (previously presented) The robotic tube handler system of claim 9 wherein the four pick fingers are slender and configured to drop into the four spaces of closely spaced matrix arranged tubes.

13. (canceled)

14. (canceled)

15. (canceled)

16. (previously presented) The robotic tube handler system of claim 12 wherein the pick head unit includes an actuator engaging the pick fingers.

17. (previously presented) The robotic tube handler system of claim 16 wherein the actuator has a cam device to spread and close the fingers.

18. (previously presented) The robotic tube handler system of claim 17 wherein the cam device is spring biased to close the fingers and, by a solenoid, actuated to open the fingers.

19. (previously presented) The robotic tube handler system of claim 2 in combination with tubes having a bottom with a visual marking and racks having tube containers with an open bottom for viewing the visual markings of tubes positioned in the tube containers of the racks wherein the housing includes a scanner under the tubes in the rack.